

33. A method of making a filtering face mask, which method comprises:

(a) providing (i) a valve seat that comprises an orifice and a seal surface, wherein the orifice allows air to pass therethrough and is surrounded by the seal surface, and (ii) a single flexible flap,

(b) supporting the single flexible flap non-centrally and operatively relative to the orifice of the valve seat to form an exhalation valve, the single flexible flap being supported such that: (i) the flexible flap assumes, in its closed state, a curved profile in a cross-sectional view thereof, which the curved profile comprises a curve that extends from a first point where a first stationary portion of the flexible flap is supported on the valve seat to a second point where a second free portion of the flexible flap contacts the seal surface; (ii) the second free portion of the flap is pressed against the seal surface of the valve seat in a closed state of the exhalation valve; (iii) the second free portion of the flexible flap is held in its closed state under any orientation of the valve, at least in part, by virtue of the curved profile thereof; and (iv) the second free portion of the flexible flap represents the only free portion of the flap and can flex so as to permit exhaled air to pass through the orifice and to provide an open state of the exhalation valve to make the flexible flap out of contact with the seal surface at the second point while the first portion of the flexible flap remains essentially stationary at the first point; and

(c) attaching the exhalation vale to a mask body that is adapted to fit over the nose and mouth of a person.

b2
35. The method of making a filtering face mask of claim 33, further comprising securing a valve cover to the valve seat, wherein the valve seat includes a flap retaining surface, and the flap retaining surface is located within an internal chamber defined by a valve cover.

36. The method of making a filtering face mask of claim 35, wherein the first stationary portion of the flexible flap is held between the flap retaining surface on the valve seat and a second member that is associated with the valve cover when the valve cover is secured to the valve seat.

37. The method of making a filtering face mask of claim 36, wherein the flexible flap is secured to the valve at the first stationary portion by mechanical clamping.

b2
38. The method of making a filtering face mask of claim 36, wherein the flexible flap can assume a curved profile, when in its closed state, that extends in from where the flexible flap contacts the second member of the valve cover to where the second portion of the flexible flap contacts the seal surface of the valve seat.

39. The method of making a filtering face mask of claim 36, wherein the flap retaining surface is oriented transversely relative to the orifice.

40. The method of making a filtering face mask of claim 39, wherein the flap retaining surface is positioned adjacent one side of the orifice.

41. The method of making a filtering face mask of claim 37, wherein the flexible flap would normally exhibit a flat configuration but is curved by virtue of the securement of the flap to the valve seat and the relative positioning and alignment between the seal surface and the flap retaining surface.

42. The method of making a filtering face mask of claim 35, wherein the flexible flap would normally exhibit a flat configuration but is curved by virtue of the securement of the flap to the valve seat and the relative positioning and alignment between the seal surface and the flap retaining surface.

b3

44. The method of making a filtering face mask of claim 33, wherein the shape of the orifice does not correspond fully to the shape of the seal surface, and wherein the flexible flap is mounted to the valve seat in cantilever fashion.

b4
46. The method of making a filtering face mask of claim 33, wherein the curvature of the flexible flap extends not only from the first and second points but also from a third point that is located at where the flexible flap contacts a location on the seal surface opposite the second point.

P 49. The method of making a filtering face mask of claim 33, wherein the valve seat includes a flap-retaining surface that is spaced from the orifice at about 1 to 3.5 millimeters.

50. The method of making a filtering face mask of claim 33, further comprising providing the valve seat from a relatively light-weight plastic that is molded into an integral one-piece body.

b4 55. The method of making a filtering face mask of claim 33, further comprising configuring the second free portion of the flexible flap to have a profile that when viewed from the front corresponds to the general shape of the seal surface and comprises a curve.

56. The method of making a filtering face mask of claim 55, wherein the flexible flap is configured to be 1.2 to 3 centimeters wide and about 1 to 4 centimeters long.

57. The method of making a filtering face mask of claim 55, wherein the flexible flap is configured to have a peripheral edge that includes a stationary segment that represents about 10 to 25 percent of the total circumferential edge of the flexible flap, with the remaining 75 to 90 percent of the peripheral edge being free to be lifted from the seal surface.

58. The method of making a filtering face mask of claim 33, wherein the flexible flap is supported on the valve such that exhaled air is deflected downward during an exhalation when the filtering face mask is worn on a person.

59. The method of making a filtering face mask of claim 33, wherein the mask body is cup-shaped and includes a filtering material and a shaping layer for providing structure to the mask.

B7 64. The method of making a filtering face mask of claim 33, wherein the exhalation valve is attached to the mask body such that the second free portion of the flexible flap resides beneath the stationary portion when the mask is worn on a person.